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In the selection of the men who should act as directors of the departments, the principal difficulty is to be encountered. The enterprise of the American is no less marked in the struggle for place and reputation, than in the struggle for the almighty dollar. Qualification is little thought of by too many persons, who from physical or mental weakness, or some other cause, desire to live without labor. The charter of an institution of research should embrace a provision, that the position of director should be forfeited by that one who should not produce some original work of merit every year or two, or during some other definite time. In no other way could the institution be preserved from the intellectual decay into which so many have fallen; and in no other way could it be protected from patrons whose kind intentions might include personal favorites unknown to scientific research. Men of money who desire to sustain original research will be compelled to devote some inquiry as to who are the men who are loyal to this work. The best index they can find to this class is the record of their work already done.

The best mode of government of such an institution would be by a senatus composed of the six directors of the departments and an equal number of trustees of the endowment. In this way the greatest amount of wisdom would be brought to bear on the two questions of administration, viz: the preservation of the fund, and the manner of its expenditure.—C.

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RECENT LITERATURE.

THE UNPAIRED FINS OF SELACHIANS.¹—Dr. Paul Mayer, under the above caption, discusses the median fins of Selachians and throws new light upon a number of morphological questions which have lately arisen. He carries Dohrn's conclusions still farther, and has actually discovered at the end of the tail and on the back of the young embryo of *Pristiurus* and of *Scyllium* homogeneous structures (*Hautknöpfe*) of subepiblastic origin, of the same substance as the horn-fibers or actinotrichia in the fin-folds. These button-like structures are found on the back of the embryo, in a single row, on either side of the median line and in advance of the permanent dorsal. At the end of the tail they are in two rows, viz., a dorsal and a ventral series. In both situations they are metameric in position, and sections show that temporary muscular buds are thrust outward towards these singular lateral larval organs from the muscular segments or myotomes in the same way as to the bundles of fibers or actinotrichia representing rays in the median and paired fins.

These remarkable organs Mayer regards as the vestiges or remnants of parapodia, and therefore names them *parapodoids*.

¹ *Die unpaaren Flossen der Selachier.* Mitt. Zool. Stat. zu Neapel. VI, pp. 217-285, pl. 15-19. 1885.

At the tip of the tail they stand in the position of the caudal neuropodia and notopodia of errant annelids, but are not, as in them, constituted of palea, bristles, etc. In the anterior dorsal region of *Scyllium*, these bodies are in the position of neuropodia.

It will thus be seen that Mayer supplies a most important set of data which lend support to the views of Dohrn as to the meaning and origin of the median and paired fins, since that author has contended that the relations of these peripheral structures to the axis of the body are to be determined by the relations they bear to the myotomes which send out muscular buds into the fins, and not on the basis of the relations to the cartilaginous appendicular skeleton or spines, as held by most other morphologists.

The table which Dr. Mayer gives to illustrate the varying relations of the same metameric elements of the median fins to the point where the vertebral axis becomes diplospondylic are also of great interest, not only morphologically, but also taxonomically. For the first time in the history of the subject, in fact, we have presented in this paper a tabulated statement of what are the actual relations of the metameric elements of the vertical fins to the myotomes of the body and the sclerotomes and nerve-pairs of the axis in the principal families of Elasmobranchii. The paper also illustrates the perfection and resources of modern biological methods. It is to be regretted that the author does not give a brief summary of his results at the close of the paper.

These researches, it may be remarked in conclusion, also show that in *Scyllium* there is developed a posterior terminal, vermiform section of the embryo which corresponds to what the writer has called an opisthure. Though it is obvious that this opisthure is rudimentary and evanescent, as it soon becomes inconspicuous. Some of the Elasmobranchii, therefore, pass through what the writer has termed an archicerical stage.

The results reached by Dr. Mayer also afford important evidence in support of the archistome theory, published by the writer in this journal recently.¹—*John A. Ryder.*

BOWER AND VINES' PRACTICAL BOTANY.²—One of the significant signs of the times, so far as botany is concerned, is the multiplication of books which are designed to encourage the practical study of plants in the microscopical and physiological laboratories. A few years ago, such a thing as a laboratory manual for the guidance of the botanical student was unheard of; now we

¹ AMERICAN NATURALIST, November, 1885, pp. 1115-1121.

² *A Course of Practical Instruction in Botany.* By F. O. BOWER, M.A., F.L.S., Lecturer on Botany at the Normal School of Science, South Kensington; and SIDNEY H. VINES, M.A., D.Sc., F.L.S., Fellow and Lecturer of Christ's College, Cambridge, and Reader in Botany in the University. With a preface by W. T. THISTLETON DYER, M.A., C.M.G., F.R.S., F.L.S., Assistant Director of the Royal Gardens, Kew. Part I., Phanerogamæ-Pteridophyta. London, Macmillan & Co., 1885.